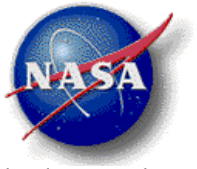
Alpha Magnetic
Spectrometer NASA / DOE

Open Paper Management Tool
Open Items Report



National Aeronautics and
Space Administration

Tuesday, April 11, 2006

Open Paper Management Tool (OPMT) Statistics

Total Action Items:	***581***	***Total Action Items Open:***	***34***
Total Action Items Closed:	***547***	***Action Items Past Due:***	***25***

List of Action Items Past Due:

Action Item Number:	***Date Due:***	***Action Item Number:***	***Date Due:***
Action Item 04-051	*08/30/2005*	*AMS_02-TTCS_PDR-5*	*2/6/2006*
Action Item 05-022	*11/21/2005*	*AMS_02-TTCS_PDR-6*	*07/15/2005*
Action Item 05-044	*10/28/2005*	*AMS_02-TTCS_PDR-7*	*07/15/2005*
Action Item 05-049	*2/1/2006*	*AMS_02-TTCS_PDR-8*	*03/31/2006*
Action Item 05-054	*09/30/2005*	*AMS_02-TTCS_PDR-9*	*07/15/2005*
Action Item 05-069	*01/03/2006*	*AMS_02-TTCS_PDR-10*	*07/15/2005*
Action Item 05-075	*12/01/2005*	*AMS_02-TTCS_PDR-11*	*07/15/2005*
Action Item 05-080	*12/01/2005*	*AMS_02-TTCS_PDR-12*	*07/15/2005*
Action Item 05-096	*4/06/2006*	*AMS_02-TTCS_PDR-20*	*07/15/2005*
Action Item 05-097	*4/06/2006*		
Action Item 05-098	*4/06/2006*		
AMS_02-PDS_CDR-06	*06/15/2005*		
AMS_02-PDS_CDR-08	*05/16/2005*		
AMS_02-PDS_CDR-09-2	*05/16/2005*		
AMS_02-Thermal_CDR-17	*1/31/2006*		
AMS_02-TTCS_PDR-3	*07/15/2005*		

Open Action Items Report

Open Item Number: 04-051 **RID Open Date:** 8/1/2004

Title:

Intiator(s):

Description:

Action Item Information

Actionee(s): OZ/Gerald Esquivel **Action Due Date:** 8/30/2005

Action: Complete and sign AMS PIA.

Action Status:
4/10/2006 - Approved at PMIT on 3/31 - scheduled for final signature in next couple of weeks.
2/24/2006 - Scheduled to present at SEWG on 3/7 - PIA will be forwarded for signature once SEWG approves.
1/6/2006 - New words approved by all parties - trying to get on agenda at SEWG for ISS approval.
10/17/2005 - All issues resolved except SSRMS power/current requirements. Draft text under review by CGS.
8/26/2005 - Based on agreement with Hartman, OZ will attempt to sign PIA prior to October TIM. OZ FY2006 AMS funding under review.
8/8/2005 - Hartman meeting moved to 8/26. PIA CR release moved to 9/9. PIA signtaure still scheduled for 12/1.
5/25/2005 - Meeting scheduled with Dan Hartman on 7/13 to resolve all final issues, PIA scheduled to be signed on 8/30. Specific TBDs being transferred into new OPMT items 05-010, 05-011, and 05-012.
3/02/2005 - It will be three weeks before it is known the amount of power to be provided. It will not be 3kW. Win Reid/OZ to set up meeting with Chris Tutt, Trent Martin, Craig Clark, John Cornwell, and Henry Hoang. Due date for this action item was changed to June 30, 2005.
02/09/2005 - ISS ICD – turning in PIA baselined first. Plan to remove the TBRs. Win Reid to check on the actions on the ISS side.

Open Action Items Report

Open Item Number: 05-022 **RID Open Date:** 9/13/2005

Title: Cryosystem Component Testing

Intiator(s):

Description: Demonstrate how cryosystem components will be validated with a non-cryogenic STA.

Action Item Information

Actionee(s): Chris Tutt/ESCG, Stephen Harrison/SCL, Phil Mott/ESCG **Action Due Date:** 11/21/2005

Action: Develop plan for validating all cryosystem components, either through component level testing or analysis.

Action Status: 4/10/06 - On-hold pending resolution of Magnet Systems Integration Contract.
2/10/2006 - TIM discussion absorbed into generic discussion of magnet schedule risks. Final decision awaits further guidance from Collaboration.
1/6/2006 - Initial list to be created and reviewed in splinter meeting at upcoming TIM.

Open Action Items Report

Open Item Number: 05-042 **RID Open Date:** 9/14/2005

Title: Helium Venting Hazard Analysis

Intiator(s):

Description: Provide hazard analysis for venting of helium from the main tank.

Action Item Information

Actionee(s): Chris Tutt/ESCG **Action Due Date:** 5/1/2006

Action: Take existing hazard analysis of helium venting presented to NASA and create stand-alone report for delivery to ESTEC.

Action Status: 3/30/2006 - Date changed again as analyst is not becoming any faster.
3/6/2006 - Date changed to 4/1 to account for slothful analyst.
11/14/2006 - Date changed to 3/1 to better reflect analyst workloads.

Open Action Items Report

Open Item Number: 05-043 **RID Open Date:** 9/14/2005

Title: Helium Venting Hazard Analysis

Intiator(s):

Description: Provide hazard analysis for venting of helium from the main tank.

Action Item Information

Actionee(s): Gaetan Piret/ESTEC **Action Due Date:** 6/1/2006

Action: Upon delivery of hazard analysis described in 05-042, evaluate potential hazards to EMI and TV test chambers.

Action Status: 4/10/06 - Due date changed to 6/1/06 allow time after completion of 05-042.
11/12/2006 - Date changed to 4/1/2006 to match item 05-042.

Open Action Items Report

Open Item Number: 05-044 **RID Open Date:** 9/14/2005

Title: Burst Disk Vent Lines

Intiator(s):

Description: Attaching a vent line to the burst disk vent location would simplify test setup.

Action Item Information

Actionee(s): Phil Mott/ESCG **Action Due Date:** 10/28/2005

Action: Evaluate feasibility of attaching a vent line at the main tank burst disk vent location.

Action Status: 2/14/2006 - Venting data provided by SCL, under review by JS.
1/6/2006 - Data requested included in last SCL contract modification.
11/4/2005 - Simple diverter may be more feasible than a fill vent line. SCL to provide exact venting locations, expected volumes, and plume temperatures to JS. JS to review and develop preliminary design.

Open Action Items Report

Open Item Number: 05-049 **RID Open Date:** 9/16/2005

Title: Supercritical Startup

Intiator(s):

Description: Determine whether or not the TTCS pumps can be started with vapor in the pump.

Action Item Information

Actionee(s): Johannes Van Es/NLR **Action Due Date:** 2/1/2006

Action: Perform test to determine performance of the pump while pumping vapor, including expected bearing life and pressure head.

Action Status: 4/10/2006 - Pressure-head was measured to be less than 1mbar - analysis in work to determine if this is sufficient. Bearing life issue resolved; no concerns.
2/14/2006 - Additional testing planned to determine pressure head at pump with only vapor present.
11/14/2005 - Second test has been defined to address some concerns with first test data. Initial results look very promising. Results due on 11/21.
11/10/2005 - Test complete - results expected soon.

Open Action Items Report

Open Item Number: 05-054 **RID Open Date:** 9/16/2005

Title: Leak Before Burst Analysis

Intiator(s):

Description: Determine whether current condensor tube design is acceptable to NASA safety community.

Action Item Information

Actionee(s): Chris Tutt/ESCG **Action Due Date:** 9/30/2005

Action: Obtain written concurrence from Glenn Ecord and Bill Manha that existing condensor tube and magnetic flange design and verification plan are acceptable.

Action Status: 4/10/2006 - Final proposal received from Bala. Meeting scheduled with B. Manha and G. Ecord to close in near future.
3/24/2006 - Plan to be formally written up by ESCG and provided to Ecord and Manha for review. Johannes van Es to confirm how condensor tubes are attached to baseplate.
11/14/2005 - Chris Tutt to arrange meeting prior to TWG meeting in Milano.
11/10/2005 - Magnetic flange added to list.

Open Action Items Report

Open Item Number: 05-068 **RID Open Date:** 9/16/2005

Title: Tracker Radiator Integration Jig

Intiator(s):

Description: Provide design for Tracker Raditor Integration Jig.

Action Item Information

Actionee(s): Antonio Alvino/INFN **Action Due Date:** 8/1/2006

Action: Provide design for Tracker Raditor Integration Jig.

Action Status: 4/10/2006 - Due date changed to 8/1/06 to accommodate work load and need date.
3/6/2006 - Actionee changed to Antonio Alvino and date changed to 4/15.
3/3/2006 - Johannes van Es to speak with Roberto Battiston and determine apprpriate actionee.

Open Action Items Report

Open Item Number: 05-069 **RID Open Date:** 9/16/2005

Title: Thermal Tubing Support Beam

Intiator(s):

Description: Thermal Tubing Support Beam needs to be assessed for possible interferences with other hardware.

Action Item Information

Actionee(s): Stephen Harrison/SCL **Action Due Date:** 1/3/2006

Action: Assess cryocooler LHP and TTCS tubing support beam violations into magnet Keep Out Zone.

Action Status: 4/10/2006 - On-hold pending resolution of Magnet Systems Integration Contract.
3/6/2006 - Discussed at charge cable telecon. Preliminary cable routing design in work and will incorporate TTCS tubing bracket to minimize weight. Dewey Nguyen will provide design to SCL for review.
11/14/2005 - Date changed to 1/3/2006 to match item 05-062.

Open Action Items Report

Open Item Number: 05-074 **RID Open Date:** 10/28/2005

Title: CGSE Support at Pad

Intiator(s): Trent Martin

Description: It is not clear how the cryogenic GSE, particularly the piping, will be supported at the pad.

Action Item Information

Actionee(s): Robert Becker/MIT, Alexander Gretchko/MIT **Action Due Date:** 6/1/2006

Action: Provide details on how the GSE will be supported at the pad.

Action Status: 3/24/2006 - Trent Martin to forward all data provided by KSC to Art Nelson for inclusion in ground safety package.
2/14/2006 - Alexander Gretchko waiting on information from KSC - Trent Martin to coordinate.

Open Action Items Report

Open Item Number: 05-075 **RID Open Date:** 10/28/2005

Title: Using magnet at ESTEC

Intiator(s): Trent Martin

Description: Using the magnet at ESTEC may be a problem due to the steel in the thermal vac chamber.

Action Item Information

Actionee(s): John Cornwell/EC, Craig Clark/ESCG, Marco Molina/CGS **Action Due Date:** 12/1/2005

Action: Determine whether magnet should be operated during thermal vacuum test and provide assessment of how presence of steel will affect the outcome.

Action Status: 4/10/2006 - Response received on all alloys with the exception of the baseplate. No issue with other areas; Joe Burger to follow-up.
3/6/2006 - Gaetan Piret confirmed all steel in the chamber is stainless, but did not provide alloy. Joe Burger to get update.
11/10/2005 - Joe Burger to contact ESTEC to determine all iron which is present in the chamber.

Open Action Items Report

Open Item Number: 05-080 **RID Open Date:** 10/28/2005

Title: Pilot Valve Vacuum Vessel Installation

Intiator(s): Trent Martin

Description: Final location of Pilot Valve Vacuum Vessel needs to be chosen.

Action Item Information

Actionee(s): Stephen Harrison/SCL, Phil Mott/ESCG **Action Due Date:** 12/1/2005

Action: SCL to provide CAD model of PVVV to Phil Mott for inclusion in the overall AMS-02 CAD model. JS will then propose an attachment location on one of the VC support rings and perform a preliminary clearance assessment.

Action Status: 4/10/06 - On-hold pending resolution of Magnet Systems Integration Contract.
3/6/2006 - PVVV location will be reviewed by SCL and details provided to JS for review.

Open Action Items Report

Open Item Number: 05-081 **RID Open Date:** 10/28/2005

Title: Charged Magnet during Beam Testing

Intiator(s): Trent Martin

Description: Ferrous metals in the beam test location could interfere with the AMS-02 magnet.

Action Item Information

Actionee(s): Robert Becker/MIT **Action Due Date:** 1/1/2007

Action: Robert Becker to provide CAD model of AMS test beam area clearly identifying all ferrous metals in the area so that a loads assessment can be done on the magnet.

Action Status: 3/3/3006 - Action on hold until beam test location finalized. Due date changed to 1/1/2007
2/14/2006 - Requirement for flight magnet during beam test is under review. Action may be moot.

Open Action Items Report

Open Item Number: 05-096 **RID Open Date:** 3/6/2006

Title: Removal of Nominal Landing Requirements

Intiator(s): Trent Martin

Description: Nominal mission has AMS-02 falling to Earth as molten metal with the rest of ISS, not landing in the Shuttle.

Action Item Information

Actionee(s): Chris Tutt/ESCG **Action Due Date:** 4/6/2006

Action: Review all requirements associated with nominal landing and on-orbit mision duration and develop a list of new analyses and document updates that would be required to remove nominal landing as a mission requirement for AMS-02.

Action Status: 4/10/2006 - C. Tutt to define follow-up actions and actionees.

Open Action Items Report

Open Item Number: 05-097 **RID Open Date:**

Title: G10 TTCS Brackets

Intiator(s): Trent Martin

Description: G10 may not be a suitable structural material since it creeps under sustained load.

Action Item Information

Actionee(s): Antonio Alvino/INFN **Action Due Date:** 4/6/2006

Action: If INFN wishes to use G10 to construct the TTCS brackets, then INFN must provide information on how it will be used, including a description of how all fasteners tied to G10 will be constrained from backing out. This data should be sent to Bruce Sommer.

Action Status: G10 is not acceptable for any structural fasteners. Discussions are underway regarding non-structural fastener applications. Non-structural fasteners are defined as those whose failure would release particle of less than 0.25 lbm.

Open Action Items Report

Open Item Number: 05-098 **RID Open Date:**

Title: Transportation Safety

Intiator(s): Leland Hill

Description: Flight and KSC Ground safety are being actively worked, but this does not cover all situations.

Action Item Information

Actionee(s): Chris Tutt, Leland Hill, Art Nelson **Action Due Date:** 4/6/2006

Action: Chris, Leland, and Art to review current safety analysis, determine what configurations are not being covered, and propose appropriate actionees.

Action Status: 4/10/2006 - Meeting scheduled for Wed. 4/12/06 to define concerns and establish actionees.

Open Action Items Report

Open Item Number: *AMS_02-CDR-06* **RID Open Date:** *5/1/2003*

Title: *AMS-CDR-1-17: Meteoroid/Orbital Debris Shielding*

Intiator(s): *E. Christiansen/NASA*

Description: *Shielding from meteoroid/debris impact is inadequate to meet protection requirements. Shielding of pressurized vessels on AMS-02 such as the vacuum case and TRD (as well as any other pressure vessel) is required to prevent catastrophic rupture of these tanks in the event of meteoroid/debris impact which would release high-velocity fragments creating a potentially serious safety issue for on-board crew. The assessed probability of no penetration (PNP) using specified environment models is 0.97 which is far below the specified 0.997 PNP requirement. Updating ballistic limit equations and models as described in the forward work plan does not appear adequate to show compliance with requirements. Additional or significantly enhanced shielding will likely be necessary to meet safety requirements.*

Action Item Information

Actionee(s): *Dana Lear/ESCG* **Action Due Date:** *7/1/2006*

Action: *Complete analysis and coordinate design of debris shields. To be completed by Phase III Safety.*

Action Status: *3/24/2006 - Leland Hill to meet with Richard Guidry/JSC and determine MMOD CR status.*
2/24/2006 - Eric Christiansen provided response to request from 2/9/2005 listed below. Response under review by safety.
05/03/05 - The AMS-02 modeling for the MMOD assessment was completed last week. Additionally, the BUMPER geometry runs have been completed. Since the input scripts have not been run in years, Dana Lear verifying/updating all inputs for both the shield ballistic response definitions (BLEs) and the mission parameters.
02/09/05 - Chris Tutt sent an email to Dana Lear requesting a letter from Eric Christiansen with the requirements and his signature.
01/19/05 - L. Hill to get in touch with D. Lear to discuss what L. Hill needs for Phase II.

Open Action Items Report

Open Item Number: *AMS_02-CDR-08* **RID Open Date:** *5/1/2003*

Title: *Shear Analysis of Items in Enlarged Holes*

Intiator(s): *B. Ritter/GSFC*

Description: *Bolts attaching the support ring to the conical flange were assumed to transfer shear, even though they are in sloppy holes this is non-conservative.*

Action Item Information

Actionee(s): *Chris Tutt/ESCG* **Action Due Date:** *5/1/2006*

Action: *Work with SWG to resolve concerns with compliance with NASA-STD-08307, including bolts in sloppy holes being assumed to take shear.*

Action Status: *3/6/2006 - Date changed to better match analyst workloads.*
11/14/2005 - Date changed to better match analyst workloads.
8/15/2005 - Analysis currently low priority. Bruce Sommer to review analyst workloads and estimate completion date.
7/22/2005 - Initial VC flange loads obtained with latest model. These loads will be used in the updated analysis.
6/17/2005 - SWG agrees that 08307 will only apply to safety critical fasteners.
5/11/2005 - Resolution plan under development. Proposal complete but needs to be written up and approved by Structures Working Group (SWG).
2/9/2005 - Action item due date was changed to May 31, 2005. Bolt analysis was done to Lockheed Martin standards. Structures Working Group (SWG) has new standards. Currently looking to see how many interfaces have issues and what needs to be done. Action item was changed from 'Work bolt concerns with the SWG.' to 'Work with SWG to resolve concerns with compliance with NASA-STD-08307, including bolts in sloppy holes being assumed to take shear.'

Open Action Items Report

Open Item Number: AMS_02-CDR-09 **RID Open Date:** 5/1/2003

Title: AMS-CDR-2-15: Missing Documents - Structural Analysis

Intiator(s): Murthy Pinnamaneni Structures/Boeing

Description: The following items were not available in the Data Package: design load factors, dynamic analysis procedure and results. From 2.2.1, AMS Report Outline.doc, Magnetic Strap Analysis and the Coupled Loads Analysis, which are identified to be in ´´separate sections.´´ Reports/documents that include: Dynamic Loads Analysis Description; Payload/Shuttle Interface Loads; Trunnion Deflection; Trunion Misalignment Loads: and Uncertainty Factors Used in the Analysis.

Action Item Information

Actionee(s): Chris Tutt/ESCG **Action Due Date:** 7/1/2006

Action: Update stress report and dynamics analyses reports. To be completed by Phase III Safety Data Pack.

Action Status:

Open Action Items Report

Open Item Number: *AMS_02-PDS_CDR-06* **RID Open Date:** *4/18/2005*

Title:

Intiator(s): *Tim Urban*

Description:

Action Item Information

Actionee(s): *Marco Molina* **Action Due Date:** *10/15/2005*

Action: *Re-evaluate thermal optical properties on the top of the PDS as there are no longer heaters located there (breakdown of MLI vs. white paint). QM & FM different ?*

Action Status: *4/10/06 - On-hold pending resolution of ETH/CGS contract.*
11/7/2005 - QM no longer exists, so second question is now irrelevant. All further PDS activities on hold until 6 Feb 2006.
8/2/2005 - Awaiting thermal analysis of revised worst hot case.

Open Action Items Report

Open Item Number: AMS_02-PDS_CDR-08 **RID Open Date:** 4/18/2005

Title:

Intiator(s): Tim Urban

Description:

Action Item Information

Actionee(s): S. Alia **Action Due Date:** 5/16/2005

Action: Add 0.03 µF per 3.2.2.2.2.A of SSP 57003, and add verification by design inspection or test.

Action Status: 4/10/06 - On-hold pending resolution of ETH/CGS contract.
11/7/2005 - All further PDS activities on hold until 6 Feb 2006.
8/22/2005 - CGS proposes release of updated document by 9/19.
8/15/2005 - Tim Urban to contact Sergio Alia and resolve remaining concerns. Closure expected by 9/5.

Open Action Items Report

Open Item Number: AMS_02-PDS_CDR-09-2 **RID Open Date:** 4/18/2005

Title:

Intiator(s): Tim Urban

Description:

Action Item Information

Actionee(s): S. Alia **Action Due Date:** 5/16/2005

Action: Update document for maximum operating temperature of 51°C (Section 3.2, requirement ID PDS-ENV-3).

Action Status: 4/10/06 - On-hold pending resolution of ETH/CGS contract.
11/7/2005 - All further PDS activities on hold until 6 Feb 2006.
8/22/2005 - CGS proposes release of updated document by 9/19.
8/2/2005 - MOT should be changed to match updated worst case hot temperature.

Open Action Items Report

Open Item Number: *AMS_02-Thermal_CDR-15* **RID Open Date:** *4/4/2005*

Title: *Inconsistent NAS1351 Bolt Yield Strengths*

Intiator(s): *Bruce Sommer/ESCG*

Description: *DISCREPANCY*
Yield strength for NAS1351 bolts in OHB report is not the same as the yield strength for the same fastener type in the CGS report. This is consistent for all OHB v.s. CGS reports.

Bolt NAS1351
OHB Yield Allowable 950 MPa (138 ksi)
CGS Yield Allowable 827 MPa (120 ksi)

Action Item Information

Actionee(s): *Marco Molina/CGS* **Action Due Date:** *4/30/2006*

Action: *Find the documentation that verifies the yield strength of the fastener and update all reports to include the same allowable for the same bolt type.*

Action Status: *3/30/2006 - Date changed to 4/30/2006 to reflect contract negotiation status.*
11/14/2006 - Date changed to 3/31/2006 to reflect contract negotiation status.
11/7/2005 - Contract negotiations still ongoing. Best estimate for test date is now 1/ 2006.
8/10/2005 - CGS proposes test data would be available to SWG by ATP+2 months. The final analysis report would be available 2.5 months after written acceptance by SWG.
5/06/2005 - Updated document received and is under review.
4/25/2005 - Procurement specifications FFS86E for NAS1351 fasteners was sent to CGS and OHB on 04/25/05. Page 7 of the document shows a minimum yield strength for these bolts is 120 ksi.

Open Action Items Report

Open Item Number: *AMS_02-Thermal_CDR-17* **RID Open Date:** *4/7/2005*

Title: *Insert test and its applicability to different size of insert*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY*
Three inserts, with size 3 fastener and face sheet of material 2024, were tested. The requirement to test 12 more insert has been planned. The upcoming test will use 6061 material face sheet. Also, there are two types of inserts, namely size 3 and size 4. The test result based on size 3 and 2024 will be deemed applicable to size 4 and 6061. Rationale has to be provided to make this jump of application.

Action Item Information

Actionee(s): *Marco Molina/CGS* **Action Due Date:** *1/31/2006*

Action: *Test result has to be presented and rationale given for the test applicability to cover size 4 insert and different face sheet material 6061. Test proposal end of April. Perform test ASAP*

Action Status: *3/30/2006 - Date changed to 4/30/2006 to reflect contract negotiation status.*
2/10/2006 - Test has been included in proposed CAST SOW.
1/31/2006 - Date changed to 1/31/2006 to reflect contract negotiation status.
8/8/2005 - CGS proposes ATP+2 months as projected test date.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-03* **RID Open Date:** *4/4/2005*

Title: *Evaporator tail need a redesign*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
1. At the time of this delta CDR, section 6 still indicates a need for evaporator tail redesign due to large deformation. The large deformation is caused by evacuated vacuum case before launch.

SUGGESTED SOLUTION:
Need to present the evaporator tail redesign as soon as possible.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *7/15/2005*

Action: *NLR to provide evaporator redesign details.*

Action Status: *4/10/2006 - Johannes is working to schedule a meeting at Nikhef prior to the April TIM with Bart and Antonio. New schedule to be established at TIM.*
3/30/2006 - Structural analysis will be done by INFN.
12/14/2006 - Eric Perrin has completed new design. Bart Verlaat to perform structural analysis. Date TBD pending contract with NIKHEF.
11/7/2005 - Johannes to send details to Bruce Sommer for review.
9/9/2005 - New design to be presented at CDR.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-05* **RID Open Date:** *4/4/2005*

Title: *Incorrect Figure Title*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
Figure 15 is mention in section 6. But there is no figure 15.

SUGGESTED SOLUTION:
Correct the typo.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *2/6/2006*

Action: *NLR to correct typos in next release of document.*

Action Status: *4/10/2006 - To be completed one-month after TTCS_PDR-03.*
11/28/2005 - Based on new NIKHEF contract, due date changed to 2/6/2006.
11/14/2006 - Date changed to 1/3 to better reflect analyst workloads.
9/9/2005 - Typo will be corrected in next release of document.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-06* **RID Open Date:** *4/4/2005*

Title: *Installation deformation release*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*

1. It is not clear how the assembly induced deformation is released after assembly. In one instance, it indicates that the 2mm deformation will be released. And in the other instance, it indicates that the 10 mm deformation is not acceptable and requires a evaporator tail redesign.

2. It is not clear how to measure the induced installation deformation. Or is there such a procedure to measure the installation deformation.

SUGGESTED SOLUTION:

1. Clarification required.

2. Implement a procedure to measure the installation deformation and set a range of acceptable installation deformation.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *7/15/2005*

Action: *NLR to clarify requirement and provide detail on how deformation will be measured.*

Action Status: *4/10/2006 - Johannes is working to schedule a meeting at Nikhef prior to the April TIM with Bart and Antonio. New schedule to be established at TIM.*
3/30/2006 - Structural analysis will be done by INFN.
11/14/2005 - Chris Tutt to contact Roberto Battiston and determine appropriate actionee.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-07* **RID Open Date:** *4/4/2005*

Title: *Visual inspection of the weld and fracture analysis*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
1. Since visual inspection will be the inspection method for post-test verification, when perform fracture analysis, the minimum crack size has to be conforming to the inspection method.
2. Is there a structural analysis performed on the welds, including fracture analysis, as required?
3. Welding is performed at room temperature. During operation, the weld will be at a much lower temperature. How do we guarantee that the weld will be performing at a much lower temperature, possibly due to residual stress?

SUGGESTED SOLUTION:
Present strength and fracture analysis.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *7/15/2005*

Action: *NLR to provide strength and fracture analysis*

Action Status: *4/10/2006 - P. Nemeth to pulse D. Rybicki*
11/28/2005 - Data received at JS and is under review.
11/14/2005 - Weld procedure is available and has been sent to Dan Rybicki/ESCG for review. Johannes Van Es/NLR to supply all documentation to Bruce Sommer by 11/18 for additional review.
9/9/2005 - Weld structural and fracture analysis to be presented at TTCS CDR. NLR to coordinate requirements with Dan Rybicki.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-08* **RID Open Date:** *4/4/2005*

Title: *Leak integrity test still TBD*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
Leak Integrity test still is listed as TBD.

SUGGESTED SOLUTION:
Establish leak integrity test procedure as soon as possible.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *3/31/2006*

Action: *NLR to provide leak integrity test procedure*

Action Status: *4/10/2006 - Procedure received on 4/10/06. Procedure appears sufficient to satisfy mission success; but not safety.*
3/3/3006 - Procedure will be sent to Bruce Sommer by 3/31.
11/14/2005 - Procedure will be sent to Bruce Sommer/ESCG by 11/15.
9/9/2005 - Leak integrity test procedure to be presented at CDR.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-09* **RID Open Date:** *4/4/2005*

Title: *TTCS tube routing*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
TTCS tube routing goes along the strut into Ram and Wake radiator. Since RAM and WAKE radiator is a much flexible structure, thus it is subjected to a large deformation and deflection. How the TTCS tube routing is attached to the strut is not clear. How the TTCS tube is attached to the strut and how it is routed into the radiator can affect the stress in the tube.

SUGGESTED SOLUTION:
Present detail information about the TTCS tube routing into RAM and WAKE radiator for review.

Action Item Information

Actionee(s): *Antonio Alvino/INFN, Bart Verlaat/NIKHEF* **Action Due Date:** *7/15/2005*

Action: *NLR to provide details of TTCS tube routing*

Action Status: *4/10/2006 - High priority work for Antonio; to be completed as soon as workload permits.*
3/30/2006 - Tubing design on hold due to newly identified requirements. Schedule for new development to be provided next week.
11/7/2005 - Preliminary work done by INFN. NLR working small contract with NIKHEF to get Bart Verlaat back on task.
9/9/2005 - Tube routing details to be presented at TTCS CDR.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-10* **RID Open Date:** *4/4/2005*

Title: *Negative safety margin*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
Negative safety margins are shown in the analysis. Though the analysis is stated as rough analysis since detail information on components at this time is still not available, suggested remedy was not presented. Or different analysis approach is not attempted.

SUGGESTED SOLUTION:
Since this is a delta CDR, remedy for negative safety margin should be provided. The remedy can be re-design of the base plate/fasteners. Or the analysis can be re-done with different approach to show a positive safety margin. Leaving negative safety margin as presented is not desirable.

Action Item Information

Actionee(s): *Corrado Gargiulo/INFN, Xinmei Qi/SYSU* **Action Due Date:** *7/15/2005*

Action: *NLR to provide remedy for any negative margins of safety presented at PDR.*

Action Status: *4/10/2006 - Johannes to pulse X. Qi*
3/3/2006 - Xinmei Qi has completed updated analysis and will provde report to Bruce Sommer for review.
11/14/2005 - Updated analysis will be presented at TWG meeting in Milano.
9/9/2005 - Updated analysis will be presented at TTCS CDR.

Open Action Items Report

Open Item Number: AMS_02-TTCS_PDR-11 **RID Open Date:** 4/4/2005

Title: Bolt and insert analysis

Intiator(s): H. C. Lo/NASA-JSC

Description: DISCREPANCY:
1. how the bolt analysis is done is not presented in the subject document.
2. bolt and insert technical information is not presented in the document.
3. it is not clear that pre-load is considered in the bolt in the analysis.

SUGGESTED SOLUTION:
Provide information and specification on bolts and inserts used.
Provide bolt and insert detail analysis, including applicable document for bolt analysis and demonstrate that bolt analysis is compliant with the applicable document.

Action Item Information

Actionee(s): Corrado Gargiulo/INFN, Xinmei Qi/SYSU **Action Due Date:** 7/15/2005

Action: NLR to provide bolt details and analysis for TTCS box.

Action Status: 4/10/2006 - Johannes to pulse X. Qi
3/3/2006 - Xinmei Qi has completed updated analysis and will provde report to Bruce Sommer for review.
11/14/2005 - Updated analysis will be presented at TWG meeting in Milano.
9/9/2005 - Details to be provided at TTCS CDR.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-12* **RID Open Date:** *4/4/2005*

Title: *Finite element analysis approach and fastener analysis*

Intiator(s): *H. C. Lo/NASA-JSC*

Description: *DISCREPANCY:*
1. "All box masses (including inside components) are modelled as uniformly distributed over the baseplate top face…"" The box itself is not connected to the base plate. And the box has its own fastening point with USS. This assumption can be in error.
2. components/baseplate interface are connected with fasteners. It appears that there is no information on these. As such, no analysis on these fasteners.
3. No analysis provided on components within TTCB.

SUGGESTED SOLUTION:
Provide information when available.
Re-do analysis as appropriate.
The components inside TTCB has to be defined as soon as possible.

Action Item Information

Actionee(s): *Corrado Gargiulo/INFN, Xinmei Qi/SYSU* **Action Due Date:** *7/15/2005*

Action: *NLR to provide design detail and finite element analysis of TTCB components.*

Action Status: *4/10/2006 - Johannes to pulse X. Qi*
3/3/2006 - Xinmei Qi has completed updated analysis and will provde report to Bruce Sommer for review.
11/14/2005 - Updated analysis will be presented at TWG meeting in Milano.
9/8/2005 - Analysis to be provided at TTCS CDR.

Open Action Items Report

Open Item Number: *AMS_02-TTCS_PDR-20* **RID Open Date:** *4/4/2005*

Title: *Modes Missing*

Intiator(s): *Mike Capell/AMS*

Description: *DISCREPANCY:*
Usually a document like this contains a table summarizing the first N modes (their frequency and effective mass).

It is not noted that this is being/has been performed, just a few pictures (Fig 17,18,19) are included without reference.

Action Item Information

Actionee(s): *Johannes Van Es/NLR* **Action Due Date:** *7/15/2005*

Action: *NLR to provide more details in the structural analysis report.*

Action Status: *4/10/2006 - Johannes to pulse X. Qi*
3/3/2006 - Johannes Van Es to provide document to Mike Capell and Craig Clark for review.
11/14/2005 - Document to be released in time to support TWG meeting in Milano.
11/7/2005 - NLR proposes 12/1 for document release date.